

BAKE-HARDENABLE COLD ROLLED STEEL SHEET HAVING EXCELLENT
FORMABILITY, AND METHOD OF MANUFACTURING THE SAME

Abstract of the Disclosure

A bake-hardenable cold rolled steel sheet, and a method of manufacturing the same, designed to have bake hardenability and excellent formability suitable for automobile bodies, and the like. The steel sheet comprises 0.003 ~ 0.005 % C, 0.003 ~ 0.03 % S, 0.01 ~ 0.1 % Al, 0.02 % or less N, 0.2 % or less P, 0.03 ~ 0.2 % Mn and/or 0.005 ~ 0.2 % Cu, and the balance of Fe and other unavoidable impurities in terms of weight%. When it comprises one of Mn and Cu, the composition of Mn, Cu, and S satisfies one of relationships: $0.58 \cdot \text{Mn}/\text{S} \leq 10$ and $1 \leq 0.5 \cdot \text{Cu}/\text{S} \leq 10$. When it comprises both Mn and Cu, the composition satisfies the relationships: $\text{Mn} + \text{Cu} \leq 0.3$ and $2 \leq 0.5 \cdot (\text{Mn} + \text{Cu})/\text{S} \leq 20$. MnS, CuS, and (Mn, Cu)S precipitates have an average size of 0.2 μm or less. The steel sheets allow the content of solid solution to be controlled by fine MnS, CuS, (Mn, Cu)S precipitates, providing improved bake hardenability, formability, yield strength, and yield strength-ductility balance.